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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Sharan et al.

Serial No.: 09/825,613

Filed: April 3, 2001

For: METHOD FOR PECVD DEPOSITION OF  
SELECTED MATERIAL FILMS

§  
§ Group Art Unit: 2829  
§  
§ Examiner: Lisa Kilday  
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§ Atty. Docket: 95-0716.03  
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REPLY TO THE EXAMINER'S ANSWER DATED JULY 26, 2004

Mail Stop Appeal Brief – Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

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9/27/04  
Date

*[Signature]*  
Signature

Dear Sir:

Applicants herein respond to the Examiner's Answer dated July 26, 2004.

I. Section 2 of Examiner's Answer

Section 7 of the Examiner's Answer addresses related appeals and interferences. Applicants herein provide an update concerning related application U.S. App. Ser. No. 09/825,612, which was filed 4/03/01 and is a sibling of the currently appealed application ('612 is a divisional and this application is a continuation of U.S. App. Ser. No. 09/249,478, filed 2/12/99 and issued as U.S. Pat. No. 6,291,341). Applicants filed an Appeal Brief for '612 on 8/27/03; the Examiner's Answer is dated 1/13/04; Applicants filed a Reply Brief on 3/15/04; and a Patent Office communication dated 6/17/04 indicated the application had been forwarded to the Board.

## II. Section 7 of Examiner's Answer

Section 7 of the Examiner's Answer addresses the grouping of claims and contains an announcement from the Examiner that the claims stand or fall together because the Appeal Brief does not state otherwise. Applicants alert the Board that the Examiner's announcement is erroneous. Applicants direct the Board to section VII of the Appeal Brief, which expressly states that the claims in group IV (1-4 and 29) do not necessarily fall together. Applicants also direct the Board to page 7, second paragraph of the Appeal Brief (addressing claim 2) for an explanation as to why the claims do not necessarily fall together.

## III. Section 10 of Examiner's Answer

Section 10 of the Examiner's Answer addresses the grounds of rejection. Applicants contend such grounds fail to address Zhao's contrary disclosure concerning at least one limitation in each of the claims. Applicants further contend a brief summary of prosecution history before addressing the latest ground of rejection will help to put the Examiner's current arguments in context.

### A. Brief Summary of Prosecution History

The first §102 rejections under Zhao appeared in the Office Action dated 3/07/02. The form of the rejection consisted of the Examiner reciting the claim language and interspersing string citations to excerpts in Zhao. (Office Action dated 3/07/02 at p. 3-4.) The cited Zhao excerpts did not express the exact claim language, and the Examiner refrained from explaining how the excerpts may be interpreted against the limitations.

In response, Applicants pointed out that the Examiner's Zhao citations did not address the claim limitations, especially those directed to a plasma of approximately 50 to 90% of a metal-containing gas or compound. (Response transmitted 6/6/02 at p. 3-7.) Applicants further argued that Zhao actually discloses only the opposite of such limitations. (*Id.*)

The Examiner found Applicants' arguments unpersuasive *due to the §112 rejection of the claims based on the "50-90%" limitations*. (Office Action dated 9/12/02 at p. 4-5.) Nevertheless, the Examiner changed the particular Zhao citations relied upon. (*Compare id.* at p. 4 *with* Office Action dated 3/07/02 at p. 3-4.) Once again, the cited Zhao excerpts did not express the exact claim language, and the Examiner refrained from explaining how the excerpts may be interpreted against the limitations.

Applicants responded by pointing out that even the new Zhao citations had been addressed in the previous Response and that those Zhao citations disclose only the opposite of the "50 to 90%" limitations. (Response transmitted 1/13/03 at p. 3.) Applicants also traversed the §112 rejections. (*Id.* at p. 2.) The Examiner repeated the §112 and §102 Zhao rejections in the Final Office Action dated 4/09/03. Yet again, the cited Zhao excerpts did not express the exact claim language, and the Examiner refrained from explaining how the excerpts may be interpreted against the limitations. Applicants appealed.

#### B. The Examiner's current arguments

The Answer's grounds for rejection demonstrate two significant points: (1) the Examiner has withdrawn the §112 basis for rejection; and (2) the Examiner has once again changed the particular Zhao citations relied upon for rejecting independent claims 1 and 29. (*Compare* Answer at p. 3-4 *with* Office Action dated 4/09/03 at p. 4.) Applicants address the implications of these points separately below.

##### 1. The Examiner's affective admission that Zhao fails to anticipate the claims

Applicants remind the Board that, during prosecution, Applicants argued that Zhao discloses only the exact opposite of at least some of the claim limitations, thereby making a Zhao-based novelty rejection untenable. (*See* Response transmitted 6/6/02 at p. 3-7.) Claim 1, for example, requires an act of contacting a substrate with a plasma of approximately 50 to 90% of a metal-containing gas. Dependent claims 2-4 incorporate this limitation. Claim 29 requires

an act of contacting a surface with a plasma of approximately 50 to 90% metal-containing compound.

Applicants argued previously and continue to argue that Zhao discloses introducing a reactant gas, such as hydrogen. (Zhao at col. 36, ln. 21-24.) Zhao also discloses a vapor that contains metal ( $\text{TiCl}_4$ ) and is flowed with a source gas (helium). (*Id.* at ln. 41-67.) Moreover, Zhao discloses that the initial reactant gas/source gas flow ratio can be almost 250:1. (*See id.* at 42-43.) Thus, because the source gas flow rate can be almost 250 times *less* than the reactant gas flow rate; and the source gas flow rate is associated with the introduction of the vapor containing the metal, it follows that the contribution of the vapor containing metal is far from 50-90%, plasma or no. While the cited text allows for a smaller ratio, Applicants contend that Zhao's emphasis of a reactant gas flow rate that may be hundreds of times greater than the source gas cannot be interpreted to disclose a metal-containing gas contributing to approximately 50-90% of a plasma. Furthermore, Zhao discloses increasing the reactant gas flow rate just before establishing a plasma (*id.* at col. 37, ln. 37-38) and indicates that such an increase reduces the quantity of  $\text{TiCl}_4$  delivered to the chamber (*id.* at ln. 9-12). Hence, once a plasma is established, Zhao discloses lowering even further the contribution of the vapor containing metal. Thus, Zhao's disclosure, including excerpts purportedly relied upon by the Examiner, disclose only the exact opposite of a plasma with approximately 50 to 90% of a metal-containing gas or compound. As a result, Zhao cannot be interpreted to anticipate the claims.

Applicants further remind the Board that the Examiner's reason for refuting this argument was the assertion of the §112 rejection based on those limitations. (Office Action dated 9/12/02 at p. 4-5 (italicized above in part A).) However, the Answer's withdrawal of the §112 rejections necessarily withdraws the Examiner's basis for refuting the argument presented immediately above and previously during prosecution. Further, Applicants can find no portion of the Examiner's current grounds for rejection that addresses Zhao's disclosure of using almost 250 times less titanium-containing gas than reactant gas. Applicants interpret the Examiner's silence as an effective admission of the persuasiveness of Applicants' argument. Applicants request the Board adopt this interpretation. At the very least, the Examiner's silence demonstrates a failure to satisfy the burden for a novelty rejection relying on Zhao.

## 2. The Examiner's new Zhao citations still fail address all of the claim limitations

In addition to the implications of the Examiner's failure to address Zhao's opposing disclosure, the Examiner's new Zhao citations warrant the Board's reversal of the Examiner for other reasons. For purposes of clarity, Applicants address the claims as separated below.

### a. Claim 1

Applicants note that the Answer's grounds for rejecting claim 1 rely on new Zhao excerpts that were not cited in the Final Office Action. Specifically, the Examiner now relies on Zhao's Title; Abstract; column 12, lines 45-50; and column 37, lines 52-56. (*Compare* Final Office Action dated 4/09/03 at p. 4 *with* Answer at p. 3.) The Examiner also cited the whole of lines 13-67 of Zhao's column 36 as disclosing the limitation concerning a plasma of approximately 50 to 90% of a metal-containing gas, whereas the Final Office Action cited only a portion of that excerpt (lines 21-24 and 41-67) as disclosing that limitation. (*Compare* Final Office Action dated 4/09/03 at p. 4 *with* Answer at p. 3.) Similar to previous Zhao rejections, section 10 of the Answer merely repeats the claim language and cites excerpts of Zhao; the cited Zhao excerpts do not express the exact claim language; and the Examiner refrained from explaining how the excerpts may be interpreted against the limitations.

Focusing on the Answer's Zhao excerpt cited against claim 1's limitation concerning a plasma of approximately 50 to 90% of a metal-containing gas, Applicants have already addressed portions of that excerpt in the Appeal Brief. (*See* Appeal Brief at p. 7, 1<sup>st</sup> ¶.) In that part of the Appeal Brief, Applicants reviewed in detail Zhao's disclosure in column 36, lines 21-24 and 41-67 and demonstrated that such excerpts failed to disclose claim 1's limitation concerning a plasma of approximately 50 to 90% of a metal-containing gas. As for the newly-cited portions, Zhao's lines 13-20 merely address a plasma gas such as argon, its entry into the chamber, and the functions of that gas; Zhao's lines 25-40 merely complete a discussion of a reactant gas such as H<sub>2</sub>, address its functions, and disclose changing the flow rate of the reactant gas. Thus, the newly-cited excerpts also fail to disclose claim 1's limitation concerning a plasma of

approximately 50 to 90% of a metal-containing gas. As a result, the grounds for rejecting claim 1 as stated in section 10 of the Answer fail to satisfy the burden for rejection.

The Examiner further addressed the rejection of claim 1 in section 11 of the Answer, wherein the Examiner responded to the Appeal Brief's arguments. Applicants address the Answer's section 11 in further detail below in part IV of this Reply Brief; however, certain points brought up by the Examiner warrant immediate response.

Applicants note that section 11 appears to be the first time in more than three years of prosecution that the Examiner actually explained how the Zhao cites are believed to apply to the claim language. Specifically, the Examiner finally addressed how Zhao allegedly discloses the limitation concerning a "plasma of approximately 50 to 90% of a metal-containing gas." The Examiner initially contends that Zhao's metal containing-gas contributes 53% of the flow rate. (Answer at p. 4 (citing Zhao at col. 36, lines 40-43).) However, a careful reading of that excerpt and the surrounding text demonstrates that the Examiner has misinterpreted Zhao's disclosure. When addressing the 53% figure, Zhao is describing the flow rate of the reactant gas ( $H_2$ ) – not the flow rate of Zhao's  $TiCl_4$  vapor or source gas. (Zhao at col. 36, lines 40-43.) Moreover, Zhao is describing the flow rate of the  $H_2$  reactant gas as a percentage of its own final flow rate independent of Zhao's  $TiCl_4$  vapor or source gas. (*Id.*)

The Examiner subsequently attempts to calculate a different percentage contribution of Zhao's metal containing-gas. Applicants understand the Examiner assume that Zhao's reactant gas contributes 11% of the "total" flow rate. (Answer at p. 5 (citing Zhao at col. 36, lines 34-37).) The Examiner appears to further assume that the source gas (containing titanium) is also present. Apparently by subtracting 11% from 100%, the Examiner concludes that Zhao's  $TiCl_4$  vapor and source gas must contribute the remaining 89% of Zhao's "total" flow rate.

However, a careful reading of this excerpt and the surrounding text demonstrates that the Examiner has once again misinterpreted Zhao's disclosure. When addressing the 11% figure, Zhao is describing the increase in flow rate of only the  $H_2$  reactant gas from an initial reactant gas flow rate to a final reactant gas flow rate. (Zhao at col. 36, ln. 27-29.) Zhao specifies the initial flow rate for the  $H_2$  reactant gas to be 11% of what its final flow rate will be. (*Id.* at ln. 34-36.) The 11% figure is independent of and irrelevant to the flow rate of Zhao's  $TiCl_4$  vapor and source gas, as Zhao does not even introduce those gases until after further increases in the

reactant gas flow rate. (*Id.* at ln. 38-42.) Thus, the Examiner has erred in believing that the 11% figure represents a percentage of the reactant+source gas “total” flow rate. More fundamentally, the Examiner has erred in assuming that Zhao’s TiCl<sub>4</sub> vapor and source gas are even present when the 11% figure applies to Zhao’s reactant gas.

The relationship between the reactant and source gases is actually found in Zhao’s next sentence, which discloses a reactant/source gas ratio of about 250:1. (*Id.* at ln. 42-43.) This is the ratio cited by Applicants previously in prosecution and above in part (B)(1). As Applicants have indicated, that ratio demonstrates Zhao’s utter failure to anticipate claim 1; the Examiner has withdrawn the relevant counterargument; and the Examiner has failed to address the substance of that portion of Zhao’s disclosure.

#### b. Claims 2-4

Dependent claims 2-4 incorporate the limitation addressed above and benefit from the arguments articulated above. Moreover, the grounds for rejecting claims 2-4 articulated in § 10 of the Answer appear to be the same as those presented in the Final Office Action dated 4/09/03. Accordingly, Applicants have already addressed their novelty in the Appeal Brief, especially the novelty of claim 2 and the reasons it does not necessarily fall with the other claims.

#### c. Claim 29

In attempting to reject claim 29, the Examiner cites new Zhao excerpts that were not cited in the Final Office Action. Specifically, the Examiner now relies upon Zhao’s title, abstract, col.5, ln 30-36, and col. 37, ln. 51-56. (Answer at p. 4.) Nevertheless, the Examiner appears to continue to rely on col. 36, lines 21-24 and 41-67 as disclosing claim 29’s limitation concerning a plasma of approximately 50 to 90% of a metal-containing compound. (*Id.*) Accordingly, Applicants have already pointed out the insufficiency of that Zhao excerpt in the Appeal Brief. The Examiner further detailed the rejection in the Answer’s section 11, citing still other Zhao excerpts that suggest the insufficiency of the grounds of rejection as stated in the Answer’s section 10. (*Id.* at p. 7-8.) Specifically, the Examiner cited lines 18-26 and 40-45 of Zhao’s column 36. (*Id.*) Applicants have already addressed those excerpts above and previously during

prosecution, demonstrating that they do not disclose the “50 to 90%” limitation. Applicants have further specified that the disclosure of Zhao’s lines 42-43 specifically disclose only the opposite of that limitation.

Therefore, the Answer’s grounds for rejection contain Zhao citations that Applicants already addressed in the Appeal Brief, which demonstrates Zhao’s failure to disclose all of the claim limitations. The Answer’s grounds for rejection also contain new Zhao citations that still fail to disclose all of the claim limitations, as demonstrated immediately above. The Answer’s grounds for rejection further fails to include Zhao excerpts cited in the Answer’s section 11, which attempts to apply Zhao to the claim limitations. Such factors demonstrate that the grounds for rejection as stated in section 10 of the Answer fail to satisfy the burden for rejection.

#### IV. Section 11 of Examiner’s Answer

Section 11 of the Examiner’s Answer responds to the Appeal Brief’s arguments. Applicants alert the Board that this section of the Answer contains several instances wherein the Examiner misinterprets Applicants’ arguments. For example, the Examiner seems to believe Applicants are arguing that Zhao as a whole discloses only gas delivery. (Answer at p. 4.) However, a careful reading of the Appeal Brief demonstrates that Applicants are arguing that the Examiner’s particular Zhao citations in the Final Office Action disclose gas delivery rather than the relevant claim limitation. (Appeal Brief at p. 7.) Similarly, the Examiner believes Applicants are arguing that Zhao as a whole does not disclose helium as an ion promoting gas. (Answer at p. 6.) Once again, a careful reading of the Appeal Brief demonstrates that Applicants are arguing that the Examiner’s particular Zhao citation in the Final Office Action fails to disclose such. (Appeal Brief at p. 7.) The fact that this section of the Answer cites other portions of Zhao in an attempt to argue Zhao’s disclosure of helium as an ion promoting gas supports Applicants’ contention. (See Answer at p. 7.) In general, Applicants respectfully request that the Board review the text of Applicants’ arguments rather than rely on the Examiner’s interpretation.

In the last paragraph of the Answer’s page 7, the Examiner addresses “containing” a surface with a plasma of approximately 50-90% metal-containing compound. Applicants assume the



Examiner intended to refer to “contacting” rather than “containing.” Applicants have refuted the substance of this portion of the Answer above.

Section 11 of the Answer also contains at least one instance wherein the Examiner appears to be relying on the Examiner’s own assumptions concerning the technology. For example, the Examiner announces on page 6 of the Answer that “the only product that can result on the substrate from the plasma deposition of Hydrogen, inert Helium, and  $\text{TiCl}_4$  is a Titanium film.” However, case precedent highlights the impropriety of the Examiner’s statements. (*See In re Zurko*, 258 F.3d 1379, 59 U.S.P.Q.2d 1693, 1697 (Fed. Cir. 2001) (prohibiting the Examiner from simply reaching conclusions based on the Examiner’s own understanding or experience concerning what is known in the art and instead requiring the Examiner to point to concrete evidence in record). A copy of *Zurko* is included in an Appendix to this Reply Brief.)

As mentioned above, section 11 appears to be the first instance where the Examiner actually attempts to apply Zhao’s disclosure to the claim limitations rather than merely interspersing a string of Zhao citations amongst the recited claim language. In doing so, the Examiner relied upon portions of Zhao that do not appear in the grounds for rejection. As a result, the Examiner has demonstrated the insufficiency of those grounds. Moreover, the Examiner’s attempt to apply Zhao merely demonstrates the Examiner’s misunderstanding of Zhao’s disclosure concerning the contribution of its  $\text{TiCl}_4$  vapor and source gas. Furthermore, the Examiner’s newest citations include excerpts that actually disclose only the opposite of the claim limitations concerning the percent contribution of a metal-containing gas or compound.

Thus, section 11 of the Examiner’s Answer fails to cure the failures of section 10’s grounds for rejection and in fact exacerbates those failures.

#### IV. Conclusion

The Answer represents the third and fourth attempts by the Examiner to cite Zhao against the claims. The third attempt, found in section 10 of the Answer, includes citations not found in the Final Office Action. The fourth attempt, found in section 11 of the Answer, includes citations not found in section 10 of the Answer. As a result, section 11 of the Answer indicates

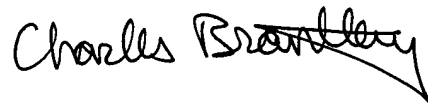
that section 10's grounds for rejection are insufficient. Further, neither section cites Zhao's disclosure sufficient to address all of the claim limitations.

Section 11 of the Answer also represents the Examiner's first attempt to actually argue how Zhao's disclosure applies against the claims rather than merely cite Zhao. However, such arguments demonstrate the Examiner's misinterpretation of Zhao's disclosure concerning the contribution of its metal-containing gas.

The Answer further fails to address Applicants' argument demonstrating that Zhao's contribution of metal-containing gas discloses only the opposite of at least one limitation in each of the claims. Still further, the Answer's withdrawal of the §112 rejections removes the Examiner's basis for ignoring Applicants' argument.

As a result, the Answer cements the Examiner's failure to satisfy the burden for a Zhao novelty rejection as well as Zhao's failure to support any novelty rejection of these claims. Accordingly, Applicants respectfully repeat the request that the Board reverse the Examiner, withdraw the rejections, and allow the claims.

Respectfully submitted,

A handwritten signature in black ink that reads "Charles Brantley". The signature is written in a cursive, slightly slanted style with a long, sweeping underline.

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Appendix 1

*In re Zurko*, 258 F.3d 1379, 59 U.S.P.Q.2d 1693 (Fed. Cir. 2001)



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In re Zurko

U.S. Court of Appeals Federal Circuit

No. 96-1258

Decided August 2, 2001

**PATENTS**

**[1] Patentability/Validity -- Obviousness -- Combining references (§ 115.0905)**

**JUDICIAL PRACTICE AND PROCEDURE**

**Procedure -- Judicial review -- Standard of review --Patents (§ 410.4607.09)**

Decision of Board of Patent Appeals and Interferences sustaining obviousness rejection of patent application for method of improving security in computer system is reversed, even though board's factual findings underlying its determination are reviewed under "substantial evidence" standard, since prior art references relied upon by board do not teach limitation requiring communications between user and "trusted" environment along "trusted" path, and since deficiencies of references cannot be remedied by reliance upon additional combination of alternative references cited for first time on appeal, or by board's general conclusion, unsupported by evidence in record, that requiring communication with trusted environment over trusted path would be "basic knowledge" or "common sense" to person of ordinary skill in art; although board's expertise alone may provide sufficient support for conclusions as to peripheral issues, its core factual findings in patentability determinations must be supported by concrete evidence in record.

On remand from the U.S. Supreme Court.

Patent application of Mary E. Zurko, Thomas A. Casey Jr., Morie Gasser, Judith S. Hall, Clifford E. Kahn, Andrew H. Mason, Paul D. Sawyer, Leslie R. Kendall, and Steven B. Lipner, serial no. 07/479,666 (method for improving security in a computer system). Board of Patent Appeals and Interferences sustained examiner's rejection of application under 35 U.S.C. § 103. The U.S. Court of Appeals \*1694 for the Federal Circuit reversed on appeal ( 42 USPQ2d 1476). On rehearing en banc, the Federal Circuit held ( 46 USPQ2d 1691) that proper standard of review for fact findings underlying patentability determinations by Patent and Trademark Office is "clearly erroneous" standard, rather than more deferential standard found in Administrative Procedure Act. The U.S. Supreme Court reversed the Federal Circuit's en banc decision and remanded, holding ( 50 USPQ2d 1930) that PTO's findings of fact must be reviewed under either "substantial evidence" or "arbitrary and capricious" APA standards of review. On remand, the Federal Circuit again reverses board's decision.

Linda Moncys Isacson, associate solicitor, John M. Whealan, solicitor, and Kenneth R. Corsello and Thomas J. Finn, associate solicitors, U.S. Patent and Trademark Office, Arlington, Va., for Commissioner of Patents and Trademarks.

John F. Sweeney, Michael O. Cummings, Jon T. Hohenthanner, Israel Blum, Steven F. Meyer, and Brenda Pomerance, of Morgan & Finnegan, New York, N.Y.; Irene Kosturakis and Russell T. Wong, of Compaq Computer Corp., Houston, Texas; Ernest Gellhorn, Washington, D.C.; Janice M. Mueller, of Suffolk University Law School, Boston Mass.; Ronald C. Hudgens, of Digital Equipment Corp., Maynard, Mass., for Mary E. Zurko et al.

Before Newman, circuit judge, Archer, senior circuit judge, and Michel, circuit judge.

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Archer, S.J.

by substantial evidence, we reverse.

This case is before us on remand from the Supreme Court of the United States. *Dickinson v. Zurko*, 527 U.S. 150, 50 USPQ2d 1930 (1999) ("*Zurko III*"). In *Zurko III*, the Court reversed our judgment and remanded the case because we had reviewed the factual findings of the Board of Patent Appeals and Interferences ("Board") for clear error, an incorrect standard of review.

The Board decision at issue, *Ex parte Zurko*, No. 94-3967 (Bd. Pat. Apps. & Int. Aug. 4, 1995), sustained the rejection of U.S. Patent Application No. 07/479,666 ("the '666 application") under 35 U.S.C. § 103 (1994). In our initial review of this decision, we determined that the Board's findings were clearly erroneous and we reversed. *In re Zurko*, 111 F.3d 887, 42 USPQ2d 1476 (Fed. Cir. 1997) ("*Zurko I*"). At the Commissioner's suggestion, we then reheard this case en banc to reconsider the question of the appropriate standard of review. The Commissioner argued that Board findings should be reviewed under the standards of the Administrative Procedure Act (APA), namely the substantial evidence or arbitrary and capricious standard. 5 U.S.C. § 706 (1994). The en banc court held, however, that clear error was the correct standard of review for Board findings of fact and adopted the conclusions of the original panel decision. *In re Zurko*, 142 F.3d 1447, 46 USPQ2d 1691 (Fed. Cir. 1998) ("*Zurko II*").

The Commissioner then petitioned for review by the Supreme Court, and the Court reversed, holding that Board findings of fact must be reviewed under the APA standards of review. The Court did not specify which APA standard of review to apply, substantial evidence or arbitrary and capricious. We subsequently decided this question in *In re Gartside*, 203 F.3d 1305, 53 USPQ2d 1769 (Fed. Cir. 2000), and held that substantial evidence is the correct APA standard of review for Board factual findings.

We now revisit the merits of our decision in *Zurko I*, applying the proper APA standard of review. In doing so, we conclude that the outcome of this case does not change with the application of this new standard of review. Because the factual findings underlying the Board's decision are not supported

## BACKGROUND

The '666 application concerns a method for more efficiently creating a secure computer environment. Secure, or "trusted," computer environments employ trusted software designed to preclude unauthorized users and to prevent unintended or unauthorized commands. Such trusted software is often quite costly, compared to untrusted software, so it is desirable to minimize the amount of trusted software in the system. Applicants claim a method for processing trusted commands with a minimum of trusted software.

Representative claim one reads as follows:

1. A machine-executed method for executing a trusted command issued by a user on a computer system, the computer system including an untrusted computing environment and a trusted computing environment, said method comprising the steps of:

\*1695 (a) parsing the trusted command in the untrusted computing environment to generate a parsed command;

(b) submitting the parsed command to the trusted computing environment;

(c) displaying a representation of the trusted command to the user through a trusted path;

(d) receiving a signal from the user through a trusted path signifying whether the displayed representation accurately represents the user's intentions;

(e) if the signal signifies that the displayed representation does not accurately represent the user's intentions, then preventing the execution of the parsed command;

(f) if the signal signifies that the displayed representation accurately represents the users intentions, executing the parsed command in the trusted environment.

As set forth in claim one, applicants' method

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involves processing and verifying a trusted command using both trusted and untrusted software. A trusted command is first processed by untrusted software to create a parsed command. The parsed command is then submitted to the trusted computer environment. Execution of this command requires verification along a trusted path. The parsed command is relayed to the user along a trusted path, and, if correct, the user can send a confirming signal back along this trusted path, allowing execution of the command. By processing a trusted command in this manner, the applicants contend they reduce the amount of trusted software. The applicants assert that the parsing step generally requires a large amount of software and that performing this step with untrusted software greatly reduces the amount of trusted code required to process a trusted command.

The Board sustained the Examiner's rejection of claims 1, 4, and 5 of the '666 application under 35 U.S.C. § 103 based on two prior art references. The primary reference is the UNIX operating system, as described in the applicants' information disclosure statement ("IDS"). According to this description, the UNIX system employs both untrusted and trusted code. Furthermore, certain commands in a UNIX system may be parsed in an untrusted environment, and then these parsed commands may be executed by "calling a trusted service that executes in a trusted computing environment."

The secondary reference, also described in applicants' IDS, is Dunford, FILER Version 2.20 ("FILER2"). This program repeats back potentially dangerous commands, requesting confirmation from the user before execution.

Considering the teachings of these two references, the Board concluded that the invention claimed by the '666 application would have been obvious. The Board commented that "the artisan would have been led from these teachings to take the trusted command parsed in an untrusted environment and submitted to the trusted computing environment, as taught by UNIX, and to display the parsed command to the user for confirmation prior to execution, as suggested by [FILER2]." *Ex parte Zurko*, slip op. at 6-7. According to the Board, this combination would render the claimed invention obvious.

The Board also responded to applicants' arguments that neither reference discloses a trusted path communication to the user and that no teaching of the prior art references motivates the combination of these references to create the claimed invention. The Board said that communication along a trusted path, if not explicit in the prior art, is either inherent or implicit. *Id.* at 7. The Board further adopted the Examiner's assertion that "it is basic knowledge that communication in trusted environments is performed over trusted paths." *Id.* at 8. As for the motivation to combine these references, the Board concluded that it "would have been nothing more than good common sense" to combine the teachings of these references. *Id.* The Board noted that FILER2 taught the verification of dangerous commands in general, suggesting verification of the parsed command submitted to the trusted computing environment in UNIX. Because this verification occurs within a trusted environment, it is "basic knowledge," according to the Board, that this verification would occur along a trusted path. *Id.* at 7-8.

Reviewing the Board's decision in *Zurko I*, we held that "the Board's finding that the prior art teaches, either explicitly or inherently, the step of obtaining confirmation over a trusted pathway [was] clearly erroneous." *Zurko I*, 111 F.3d at 889, 42 USPQ2d at 1478. Indeed, we noted that neither reference relied upon by the Board taught communication with \*1696 the user over a trusted pathway. *Id.*, 42 USPQ2d at 1479. We further held that the Board clearly erred in finding that the prior art teaches communicating with the user over both a trusted and an untrusted path. This finding was in conflict with the Board's other finding that trusted communications must be over trusted paths. *Id.* at 890, 42 USPQ2d at 1479.

On remand, applicants urge that we maintain our reversal of the Board's decision, arguing that the decision is legally flawed, or, alternatively, that the Board's factual findings fail under the APA standard of review. The Commissioner responds that we must affirm the Board decision because its findings are supported by substantial evidence in the record.

## DISCUSSION

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A claimed invention is unpatentable for obviousness if the differences between it and the prior art "are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art." 35 U.S.C. § 103(a) (1994); *Graham v. John Deere Co.*, 383 U.S. 1, 14, 148 USPQ 459, 465 (1966). Obviousness is a legal question based on underlying factual determinations including: (1) the scope and content of the prior art, including what that prior art teaches explicitly and inherently; (2) the level of ordinary skill in the prior art; (3) the differences between the claimed invention and the prior art; and (4) objective evidence of nonobviousness. *Graham*, 383 U.S. at 17-18, 148 USPQ at 467; *In re Dembiczak*, 175 F.3d 994, 998, 50 USPQ 1614, 1616 (Fed. Cir. 1999); *In re Napier*, 55 F.3d 610, 613, 34 USPQ2d 1782, 1784 (Fed. Cir. 1995) (stating that the inherent teachings of a prior art reference is a question of fact). We review the ultimate legal determination of obviousness without deference. *In re Dembiczak*, 175 F.3d at 998, 50 USPQ at 1616. We review factual findings underlying this determination for substantial evidence. *In re Gartside*, 203 F.3d at 1311-16, 53 USPQ2d at 1772-75.

Substantial evidence is "such relevant evidence as a reasonable mind might accept as adequate to support a conclusion." *Consol. Edison Co. v. NLRB*, 305 U.S. 197, 229 (1938); see also *Zurko III*, 527 U.S. at 162, 50 USPQ2d at 1772-75. A review under this standard "involves an examination of the record as a whole, taking into consideration evidence that both justifies and detracts from the agency's decision." *In re Gartside*, 203 F.3d at 1312, 53 USPQ2d at 1773 (citing *Universal Camera Corp. v. NLRB*, 340 U.S. 474, 487-88 (1951)). In addition, "the possibility of drawing two inconsistent conclusions from the evidence does not prevent an administrative agency's finding from being supported by substantial evidence." *Consolo v. Fed. Maritime Comm'n*, 383 U.S. 607, 619-20 (1966).

The substantial evidence standard has been analogized to the review of jury findings, and it is generally considered to be more deferential than the clearly erroneous standard of review. *Zurko III*, 527 U.S. at 162-63, 50 USPQ2d at 1936. The Supreme Court noted in *Zurko III*, however, that this

generally recognized difference is "a subtle one," so fine that in its review of case law in the *Zurko III* decision, the Court could not find any other case where a reviewing court had conceded that the standard of review made a difference. *Id.* Moreover, while appellate courts must respect agency expertise, the Court has "stressed the importance of not simply rubber-stamping agency fact finding." *Id.* (citing *Universal Camera*, 340 U.S. at 477-78). Indeed, the Court observed that Federal Circuit judges "will examine [Board fact] findings through the lens of patent-related experience -- and properly so, for the Federal Circuit is a specialized Court." *Id.* The Court further noted that this "comparative expertise, by enabling the Circuit better to understand the basis for the [Board's] finding of fact, may play a more important role in assuring proper review than would a theoretically somewhat stricter standard." *Id.*

With this guidance from the Supreme Court in mind, we now reconsider the Board's decision. Applicants urge that we reaffirm our conclusion in *Zurko I*, alleging numerous legal and factual errors in the Board decision. These arguments center around two issues. First, applicants argue that the prior art relied upon by the Board does not disclose one of the limitations of their claimed invention, namely communication between a trusted environment and the user along a trusted path. Second, applicants claim that there is no substantial evidence support for the Board's finding of motivation to combine the cited references to yield the claimed invention. We only need to consider the first issue raised by applicants.

As to this first issue, the Commissioner apparently concedes that neither the UNIX IDS disclosure nor FILER2 teaches communications between the user and the trusted environment along a trusted path. Nevertheless, the Commissioner maintains that the Board's findings concerning the content of the prior art are supported by four other references in the record. [FN1][1] As to this first issue, the Commissioner apparently concedes that neither the UNIX IDS disclosure nor FILER2 teaches communications between the user and the trusted environment along a trusted path. Nevertheless, the Commissioner maintains that the Board's findings concerning the content of the prior art are

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supported by four other references in the record. [FN1] The Commissioner argues that these additional references describe modified UNIX systems that allow communication over both trusted and untrusted paths. Therefore, the Commissioner argues, the Board's general findings concerning the content of the prior art have substantial evidence support, as does its ultimate conclusion of obviousness.

We are unpersuaded by the Commissioner's arguments. The Board's conclusion of obviousness was based on the UNIX and FILER2 references. The Board's findings with respect to these references simply cannot be supported by the alternative references identified by the Commissioner on remand. To the contrary, these alternative references merely confirm the well-known fact that conventional UNIX systems do not allow communication between the user and the trusted environment along a trusted path. For example, Johrie et al., U.S. Pat. No. 4,918,653, comments that "[s]ome examples of prior art multi-user operating systems which have not provided an effective mechanism for establishing a trusted path include UNIX . . . ." Johrie, col. 1, II. 60-63.

The Commissioner also cannot now mend the Board's faulty conclusion of obviousness by substituting these alternative references for those relied upon by the Board. This new combination of references would constitute a new ground for rejection, not considered or relied upon by the Examiner or the Board. It is well settled that it would be inappropriate for us to consider such a new ground of rejection. *In re Margolis*, 785 F.2d 1029, 1032; 228 USPQ 940, 942 (Fed. Cir. 1986); see also *Koyo Seiko Co., Ltd. v. United States*, 95 F.3d 1094, 1099 (Fed. Cir. 1996) (holding that "[t]he grounds upon which an administrative order must be judged are those upon which the record discloses that its action was based.") (quoting *SEC v. Chenery Corp.*, 318 U.S. 80, 87 (1943)).

Finally, the deficiencies of the cited references cannot be remedied by the Board's general conclusions about what is "basic knowledge" or "common sense" to one of ordinary skill in the art. As described above, the Board contended that even if the cited UNIX and FILER2 references did not

disclose a trusted path, "it is basic knowledge that communication in trusted environments is performed over trusted paths" and, moreover, verifying the trusted command in UNIX over a trusted path is "nothing more than good common sense." *Ex parte Zurko*, slip op. at 8. We cannot accept these findings by the Board. This assessment of basic knowledge and common sense was not based on any evidence in the record and, therefore, lacks substantial evidence support. As an administrative tribunal, the Board clearly has expertise in the subject matter over which it exercises jurisdiction. This expertise may provide sufficient support for conclusions as to peripheral issues. With respect to core factual findings in a determination of patentability, however, the Board cannot simply reach conclusions based on its own understanding or experience -- or on its assessment of what would be basic knowledge or common sense. Rather, the Board must point to some concrete evidence in the record in support of these findings. [FN2] To hold otherwise would render the process of appellate review for substantial evidence on the record a meaningless exercise. *Baltimore & Ohio R.R. Co. v. Aderdeen & Rockfish R.R. Co.*, 393 U.S. 87, 91-92 (1968) (rejecting a determination of the Interstate Commerce Commission with no support in the record, noting that if the Court were to conclude otherwise "[t]he requirement for administrative decisions based on substantial evidence and reasoned findings -- which alone make effective judicial review \*1698 possible -- would become lost in the haze of so-called expertise"). Accordingly, we cannot accept the Board's unsupported assessment of the prior art.

## CONCLUSION

The Board's conclusion of obviousness was based on a misreading of the references relied upon and, therefore, lacks substantial evidence support. Accordingly, the Board's judgment is reversed.

**REVERSED.**

FN1. Specifically, the Commissioner points to Johrie et al, U.S. Pat. No. 4,918,653; E.J. McCauley et al., *KSOS: The Design of a Secure Operating System*,



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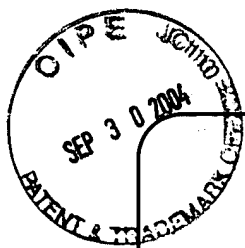
Ford Aerospace and Communications Corp. (1979); Stanley R. Ames, Jr. et al., *Security Kernel Design and Implementation: An Introduction*, IEEE Cat. No. 830700-001 (July 1983); and Simon Wiseman et al., *The Trusted Path Between Smite and the User*, Proceedings 1988 IEEE Symposium on Security and Privacy (April 18-21, 1988).

FN2. As described above, we cannot accept the Commissioner's invitation to now search the record for references in support of the Board's general conclusions concerning the prior art. Even if any such references could support these conclusions, it would be inappropriate for us to consider references not relied upon by the Board. *In re Margolis*, 785 F.2d at 1032; 228 USPQ at 942.

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# FEE TRANSMITTAL for FY 2004

Effective 10/01/2003. Patent fees are subject to annual revision.

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$ ) 0

## Complete if Known

Application Number 09/825,613  
Filing Date April 3, 2001  
First Named Inventor Sharan et al.  
Examiner Name Lisa Kilday  
Art Unit 2829  
Attorney Docket No. 95-0716.03

## METHOD OF PAYMENT (check all that apply)

☐ Check ☐ Credit card ☐ Money Order ☐ Other ☒ None

☐ Deposit Account:

Deposit  
Account  
Number

Deposit  
Account  
Name

The Director is authorized to: (check all that apply)

☐ Charge fee(s) indicated below ☐ Credit any overpayments  
☐ Charge any additional fee(s) during the pendency of this application  
☐ Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.

## FEE CALCULATION

### 1. BASIC FILING FEE

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)		
1001	770	2001	385	Utility filing fee	
1002	340	2002	170	Design filing fee	
1003	530	2003	265	Plant filing fee	
1004	770	2004	385	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	
SUBTOTAL (1)					(\$ ) 0

### 2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

Total Claims  -20 \*\* =  0 X  =  0  
Independent Claims  -3 \*\* =  0 X  =  0  
Multiple Dependent  X  =  0

Large Entity		Small Entity		Fee Description
Fee Code	Fee (\$)	Fee Code	Fee (\$)	
1202	18	2202	9	Claims in excess of 20
1201	86	2201	43	Independent claims in excess of 3
1203	290	2203	145	Multiple dependent claim, if not paid
1204	86	2204	43	** Reissue independent claims over original patent
1205	18	2205	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) (\$ ) 0

\*\*or number previously paid, if greater; For Reissues, see above

## FEE CALCULATION (continued)

### 3. ADDITIONAL FEES

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)		
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet.	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	110	2251	55	Extension for reply within first month	
1252	420	2252	210	Extension for reply within second month	
1253	950	2253	475	Extension for reply within third month	
1254	1,480	2254	740	Extension for reply within fourth month	
1255	2,010	2255	1,005	Extension for reply within fifth month	
1401	330	2401	165	Notice of Appeal	
1402	330	2402	165	Filing a brief in support of an appeal	
1403	290	2403	145	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	110	2452	55	Petition to revive - unavoidable	
1453	1,330	2453	665	Petition to revive - unintentional	
1501	1,330	2501	665	Utility issue fee (or reissue)	
1502	480	2502	240	Design issue fee	
1503	640	2503	320	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR 1.17 (q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	770	2809	385	Filing a submission after final rejection (37 CFR § 1.129(a))	
1810	770	2810	385	For each additional invention to be examined (37 CFR § 1.129(b))	
1801	770	2801	385	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	

Other fee (specify) \_\_\_\_\_

\*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) (\$ ) 0

## SUBMITTED BY

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